BlackDiamond Switch Hardware Installation Guide

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Contents

PREFACE

Introduction ix
Conventions x
Related Publications xi

1 BLACKDIAMOND 6800 SWITCH OVERVIEW

Summary of Features 1-1
- Port Connections 1-3
  - Media Types and Distances 1-4
- Full-Duplex 1-5

BlackDiamond 6800 Switch Components 1-5
- BlackDiamond 6800 Switch Power Supply 1-7
  - Power Supply LEDs 1-7
- Management Switch Fabric Module 64 (MSM64i) 1-7
  - MSM64i Behavior 1-8
  - MSM64i Memory 1-9
  - MSM64i LEDs 1-11
- I/O Module Cards 1-11
  - G4X, G6X, and G8Xi Modules 1-12
  - G8SXi and G12SXi Modules 1-14
  - F32T and F48Ti Modules 1-15
  - F32F Module 1-16
  - I/O Module LEDs 1-17

BlackDiamond 6800 Switch Rear View 1-17

BlackDiamond 6800 Switch Fan Tray 1-19
GBIC Types and Hardware/Software Support 1-19

2 INSTALLATION AND SETUP

Following Safety Information 2-1
Determining the System Location 2-2
Installing the BlackDiamond 6800 Switch 2-2
Powering On the System 2-7
Checking the Installation 2-8
Connecting Equipment to the Console Port 2-8
Logging In for the First Time 2-10

3 SERVICE AND MAINTENANCE

Following Safety Information 3-1
Removing and Replacing a Module Card 3-2
Removing and Replacing a Power Supply 3-3
Removing and Replacing the Fan Tray 3-4
Adding and Removing SODIMMs 3-5
Adding and Removing GBICs 3-7

A SAFETY INFORMATION

Important Safety Information A-1
Power A-1
Power Cord A-2
Connections A-3
Lithium Battery A-3

B TECHNICAL SPECIFICATIONS

INDEX

Figures

1-1 BlackDiamond 6800 switch 1-6
1-2 Management Switch Fabric Module 64 (MSM64i) 1-8
1-3 MSM64i SODIMM sockets 1-10
1-4 G4X module, G6X module, and G8Xi module 1-13
1-5 G8SXi module and G12SXi module 1-14
1-6 F32T and F48Ti modules 1-15
1-7 F32F module 1-16
1-8 BlackDiamond 6800 switch rear view 1-18
2-1 Rack-mount helper bracket 2-3
2-2 BlackDiamond 6800 chassis mounted in rack 2-4
2-3 Power supply bays 2-5
2-4 MSM64i with extended ejector/injector handles 2-6
2-5 BlackDiamond Power Cable and Plug 2-8
2-6 Null-modem cable pinouts 2-9
2-7 PC-AT serial null-modem cable pinouts 2-10
3-1 BlackDiamond 6800 power supplies 3-3
3-2 Removing the fan tray 3-4
3-3 Adding a SODIMM 3-6
3-4 GBIC connectors 3-7

Tables

1 Notice Icons x
2 Text Conventions x
1-1 Media Types and Distances 1-4
1-2 1000BASE-LX70 Specifications 1-5
1-3 Power Supply LEDs 1-7
1-4 MSM64i SODIMM Memory Combinations 1-10
1-5 MSM64i LEDs 1-11
1-6 I/O Module LEDs 1-17
2-1 Console Connector Pinouts 2-9

Preface

This Preface provides an overview of this guide, describes guide conventions, and lists other publications that may be useful.

INTRODUCTION

This guide provides the required information to install the BlackDiamond™ 6800 switch.

This guide is intended for use by network administrators who are responsible for installing and setting up network equipment. It assumes a basic working knowledge of

- Local Area Networks (LANs)
- Ethernet concepts
- Ethernet switching and bridging concepts
- Routing concepts
- Simple Network Management Protocol (SNMP)

For information on configuring the BlackDiamond 6800 switch, refer to the *ExtremeWare Software User Guide.*

If the information in the "Release Notes" shipped with your switch differs from the information in this guide, follow the "Release Notes."

CONVENTIONS

Table 1 and Table 2 list conventions used throughout this guide.

Table 1: Notice Icons

Icon	Notice Type	Alerts you to...
	Note	Important features or instructions.
	Caution	Risk of personal injury, system damage, or loss of data.
	Warning	Risk of severe personal injury.

Table 2: Text Conventions

Convention	Description
`Screen displays`	This typeface represents information as it appears on the screen, or command syntax.
`Screen displays bold`	This typeface represents commands that you type.
The words “enter” and “type”	When you see the word “enter” in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says “type.”
[Key] names	Key names appear in text in one of two ways: ■ Referred to by their labels, such as “the Return key” or “the Escape key” ■ Written with brackets, such as [Return] or [Esc] If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press [Ctrl]+[Alt]+[Del].
Words in *italicized* type	Italics emphasize a point or denote new terms at the place where they are defined in the text.

RELATED PUBLICATIONS

The BlackDiamond documentation set includes the following:

- *ExtremeWare Software User Guide*
- *ExtremeWare Quick Reference Guide*
- BlackDiamond 6800 Switch "Release Notes"

Documentation for Extreme Networks products is available on the World Wide Web at the following location:

- Extreme Networks home page http://www.extremenetworks.com/

1 BlackDiamond 6800 Switch Overview

The BlackDiamond 6800 switch is a chassis-based switch designed to be placed in the core of your network. The BlackDiamond 6800 switch is flexible and scalable, making it easy for you to meet the changing requirements of your network. The combination of BlackDiamond and Summit switches delivers a consistent end-to-end network solution that provides a nonblocking architecture, wire-speed switching, wire-speed IP routing, and policy-based Quality of Service (QoS).

This chapter describes the following:

- BlackDiamond 6800 switch features
- Network configurations using the BlackDiamond 6800 switch
- BlackDiamond 6800 switch components

SUMMARY OF FEATURES

The features of the BlackDiamond 6800 switch include the following:

- A 10-slot chassis that can be populated with up to 8 input/output (I/O) modules and two Management Switch Fabric Modules (MSM64i modules)
- I/O modules and MSM64i modules are hot-swappable, and include Gigabit Ethernet or 10/100 Mbps Ethernet ports
- Redundant, load-sharing, hot-swappable power supplies
- Field-replaceable, hot-swappable fan tray
- Up to 384 switched 10BASE-T/100BASE-TX Ethernet ports

- Up to 224 switched 100BASE-FX Fast Ethernet ports
- Up to 96 switched Gigabit Ethernet ports
- Fully nonblocking operation
  - All ports transmit and receive packets at wire speed
- Autonegotiation for half- or full-duplex operation on 10/100 Mbps ports
- Load-sharing on multiple ports
- Virtual local area networks (VLANs), including support for IEEE 802.1Q
- Spanning Tree Protocol (STP) (IEEE 802.1D) with multiple STP domains
- Policy-based Quality of Service (QoS)
- Wire-speed Internet Protocol (IP) routing
- IP Multinetting
- Dynamic Host Configuration Protocol/Bootstrap Protocol (DHCP/BOOTP) Relay
- Routing Information Protocol (RIP) version 1 and RIP version 2
- Open Shortest Path First (OSPF) routing protocol
- IPX routing, including RIP and Service Advertisement Protocol (SAP)
- Wire-speed IP multicast routing support
- Internet Group Multicast Protocol (IGMP) and IGMP snooping
- Distance Vector Multicast Routing protocol (DVMRP)
- IGMP snooping to control IP multicast traffic
- Console (RS-232) command-line interface (CLI) connection
- Telnet CLI connection
- ExtremeWare™ Vista™ Web-based management interface
- Simple Network Management Protocol (SNMP) support

PORT CONNECTIONS

The BlackDiamond 6800 switch supports the following I/O modules:

- G4X module

  The G4X module has four Gigabit Ethernet ports, using standard Gigabit Interface Connectors (GBICs). The G4X module supports 1000BASE-SX, 1000BASE-LX, and 1000BASE-LX70 GBIC modules.

- G6X module

  The G6X module has six Gigabit Ethernet ports, using standard GBICs. The G6X module supports 1000BASE-SX, 1000BASE-LX, and 1000BASE-LX70 GBIC modules.

- G8Xi module

  The G8Xi module has eight unpopulated GBIC-based Gigabit Ethernet ports. The G8Xi module supports 1000BASE-SX, 1000BASE-LX, and 1000BASE-LX70 GBIC modules.

- G8SXi module

  The G8SXi module has eight Gigabit Ethernet ports, using standard MT-RJ connectors. The G8SXi module supports 1000BASE-SX only.

- G12SXi module

  The G12SXi module has twelve Gigabit Ethernet ports, using standard MT-RJ connectors. The G12SXi module supports 1000BASE-SX only.

- F32T module

  The F32T module has 32 10/100 Mbps autosensing Ethernet ports, using standard RJ-45 connectors. The F32T module supports 10BASE-T and 100BASE-TX.

- F48Ti module

  The F48Ti module has 48 10/100 Mbps autosensing Ethernet ports, using standard RJ-45 connectors. The F48Ti module supports 10BASE-T and 100BASE-TX.

- F32F module

  The F32F module has 32 100 Mbps Ethernet ports, using standard MT-RJ connectors. The F32F module supports 100BASE-FX in full-duplex mode.

Caution: Modules that use SX, LX, LX70, and FX interfaces contain Class 1 laser devices. Invisible laser radiation can occur when open. Avoid direct eye exposure to beam.

MEDIA TYPES AND DISTANCES

Table 1-1 describes the media types and distances for the different types of BlackDiamond 6800 switch ports.

Table 1-1: Media Types and Distances

Standard	Media Type	Mhz/Km Rating	Maximum Distance
1000BASE-SX	50/125 µm Multimode Fiber	400	500 Meters
	50/125 µm Multimode Fiber	500	550 Meters
	62.5/125 µm Multimode Fiber	160	220 Meters
	62.5/125 µm Multimode Fiber	200	275 Meters
1000BASE-LX	50/125 µm Multimode Fiber	400	550 Meters
	50/125 µm Multimode Fiber	500	550 Meters
	62.5/125 µm Multimode Fiber	500	550 Meters
	10u Single-mode Fiber		5,000 Meters
	10u Single-mode Fiber*		10,000 Meters
1000BASE-LX70	10u Single-mode Fiber		70,000 Meters
100BASE-FX	50/125 µm Multimode Fiber (full-duplex operation)		2000 Meters
	62.5/125 µm Multimode Fiber (full-duplex operation)		2000 Meters
1000BASE-T	Category 5 and higher UTP Cable		100 Meters
100BASE-TX	Category 5 and higher UTP Cable		100 Meters
10BASE-T	Category 3 and higher UTP Cable		100 Meters

*Extreme Networks proprietary. Connections between two Extreme Networks 1000BASE-LX interfaces can use a maximum distance of 10,000 meters.

Table 1-2 describes the specifications for the 1000BASE-LX70 interface.

Table 1-2: 1000BASE-LX70 Specifications

Parameter	Minimum	Typical	Maximum
Transceiver			
Optical Output Power	0dBm	3dBm	5dBm*
Center Wavelength	1540nm	1550nm	1560nm
Receiver			
Optical Input Power Sensitivity	-20dBm		
Optical Input Power Maximum			-3dBm
Operating Wavelength	1200nm		1560nm

*The transmitter output power level for the 1000BASE-LX70 is +5dBm. The maximum allowable receiver input power level is -3dBm. Therefore, there is a minimum of 8dB loss required for the link to operate without errors. This minimum required loss can be achieved using a fiber length of 32km (0.25dB/km provides 8dB loss), or by adding 10dB of fixed optical attenuator at the receiver end.

FULL-DUPLEX

The BlackDiamond 6800 switch provides full-duplex support for all ports. Full-duplex allows frames to be transmitted and received simultaneously and, in effect, doubles the bandwidth available on a link. All ports on the BlackDiamond 6800 switch autonegotiate for half- or full-duplex operation. Gigabit Ethernet and 100BASE-FX ports operate in full-duplex mode, only.

BLACKDIAMOND 6800 SWITCH COMPONENTS

The BlackDiamond 6800 switch, shown in Figure 1-1, consists of the following components:

- One 10-slot chassis with backplane
- Eight I/O module slots, labeled Slot 1 through Slot 8
- Two MSM64i module slots, labeled Slot A and Slot B
- Two power supplies
- One fan tray (accessed from the rear of the unit)
- One electromagnetic discharge (ESD) wrist strap receptacle

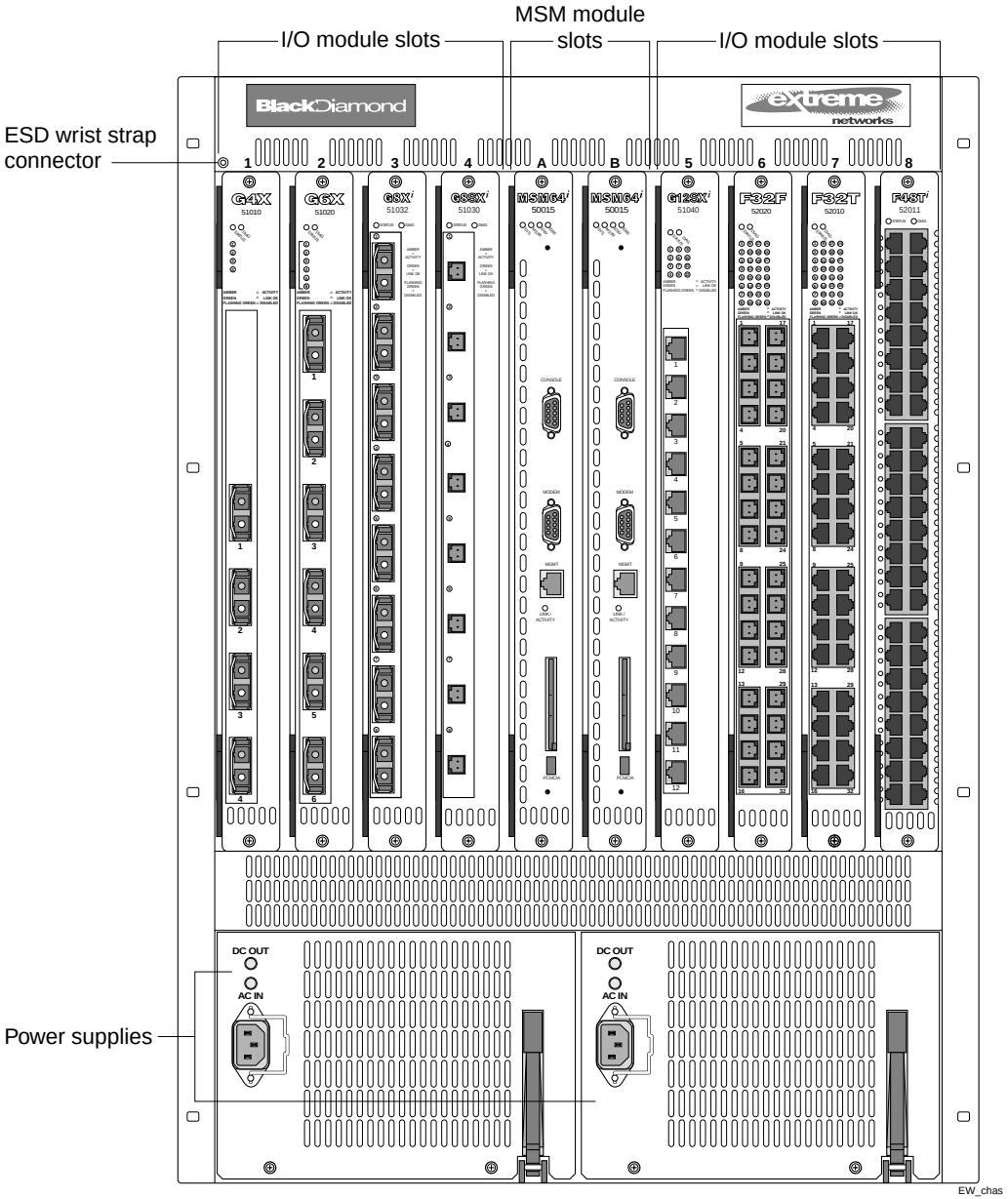

Figure 1-1: BlackDiamond 6800 switch

BLACKDIAMOND 6800 SWITCH POWER SUPPLY

The BlackDiamond 6800 switch can have one or two A/C power supplies that use 220V power. When two power supplies are present, the power is load-shared between the supplies for enhanced longevity. The power supplies are hot-swappable.

SNMP traps are sent for the following events:

- A/C power failure
- Power supply failure
- Power supply is removed

POWER SUPPLY LEDS

Table 1-3 describes the light emitting diode (LED) behavior on the power supply.

Table 1-3: Power Supply LEDs

LED	Color	Indicates
A/C In	Green	Powered using 220V input
	Amber	Powered using 110V input
	Off	No power
D/C Out	Green	All D/C outputs are operational
	Amber	One or more D/C outputs have failed
	Off	No power

MANAGEMENT SWITCH FABRIC MODULE 64 (MSM64i)

The MSM64i is the internal switch fabric for data that is being sent between I/O modules. Each MSM64i has two CPUs for protocol processing and network management. Up to two MSM64i modules can be installed in the BlackDiamond 6800 chassis for full redundancy. Using two MSM64i modules, the BlackDiamond 6800 switch is a fully non-blocking switch. Packet throughput between I/O modules on the BlackDiamond 6800 switch is 64 Gbps when one MSM64i module is used, and 128 Gbps when two MSM64i modules are present.

The MSM64i must be installed in one of the two center slots of the BlackDiamond 6800 chassis, labeled Slot A and Slot B. Figure 1-2 shows the MSM64i.

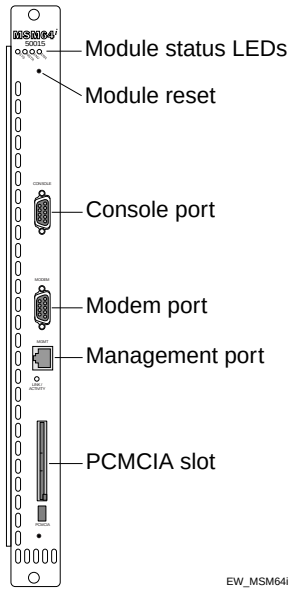

Figure 1-2: Management Switch Fabric Module 64 (MSM64i)

The MSM64i has the following ports:

- Console port (used to connect a terminal and perform local out-of-band management)
- 10BASE-T/100BASE-TX Ethernet management port
- Modem port (used to connect a modem for remote access to the CLI)
- PCMCIA slot (not used for normal operation)

MSM64i BEHAVIOR

The BlackDiamond 6800 switch can run with a single MSM64i installed. When a second MSM64i is used, one of the MSM64i modules is selected to be the *master MSM64i*, and the other becomes the *slave MSM64i*.

The master MSM64i is responsible for upper-layer protocol processing and system-management functions. For example, OSPF computation and SNMP functions are

performed by the master MSM64i. Packet handling is distributed among the four CPUs on both MSM64i modules.

Selection of the master MSM64i occurs automatically. The following scenarios describe the selection process:

- When the BlackDiamond 6800 switch boots with both MSM64i modules already installed, the MSM64i in Slot A becomes the master.
- When the BlackDiamond 6800 switch boots with a single MSM64i (regardless of the slot), it is selected as the master. If another MSM64i is added to the switch while powered on, the added MSM64i becomes the slave. The slave MSM64i can be inserted and de-inserted in the chassis without disruption of network services.

If you de-insert the master MSM64i while the BlackDiamond 6800 switch is operating, the slave MSM64i does a soft reset and becomes the master MSM64i.

When you save the switch configuration, it is saved to both MSM64i modules. If you download a new ExtremeWare image, the image is downloaded to both MSM64i modules.

MSM64i MEMORY

The MSM64i has two 144-pin SODIMM sockets, and ships with two 128MB SODRAM modules installed, as shown in Figure 1-3. In the future, the memory capacity with be increased by replacing the SODIMM module(s).

Only SODIMMs supplied by Extreme Networks are supported in the MSM64i.

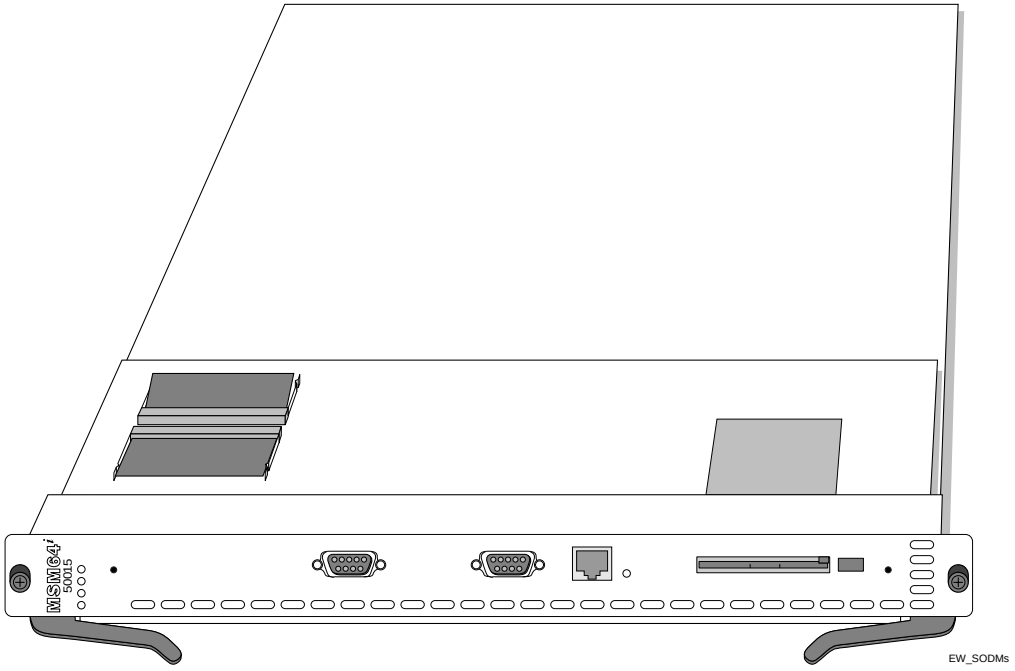

Figure 1-3: MSM64i SODIMM sockets

For larger network configurations and larger routing tables, you can add additional memory to the MSM64i. The MSM64i can be populated with any of the memory combinations described in Table 1-4.

Table 1-4: MSM64i SODIMM Memory Combinations

J8	J9	Total Memory
64 MB	64 MB	128 MB
128 MB	0 MB	128 MB
128 MB	64 MB	192 MB
128 MB	128 MB	256 MB

If you are using two MSM64i modules, both modules must have the identical memory configuration.

For more information on adding or removing SODIMMs, refer to Chapter 3.

MSM64i LEDs

Table 1-5 describes the LED behavior on the MSM64i.

Table 1-5: MSM64i LEDs

LED	Color	Indicates
SYS	Green (blinking)	Normal operation
	Amber (blinking)	Diagnostic test in progress
	Amber	Diagnostic failure
	Off	No power
MSTR	Green	Master MSM64i
	Amber	Slave MSM64i
ENV	Green	Environment (temperature, fan, power supply) is operating properly
	Amber	Environmental failure
ERR	Amber	Critical software error logged since power up
	Off	Normal operation
Link/Activity	Off	Link down
	Green	Link up
	Amber	Packet activity

I/O MODULE CARDS

The BlackDiamond 6800 switch has 8 I/O modules, as follows:

- G4X module
- G6X module
- G8Xi module
- G8SXi module
- G12SXi module
- F32T module

- F48Ti module
- F32F module

I/O modules can be inserted or de-inserted at any time, without causing disruption of network services. No configuration information is stored on the I/O modules; all configuration information is stored on the MSM64i module(s).

When the BlackDiamond 6800 switch is powered on, ExtremeWare generates a default configuration for any slots that are occupied with I/O modules. The default configuration allows the I/O module ports to participate in the VLAN named *default*. The default configuration for the I/O module is not preserved unless you explicitly save the information to nonvolatile RAM (NVRAM).

You can use ExtremeWare to configure the I/O module. You can also pre-configure the parameters of a module that has not yet been inserted into the chassis. The pre-configured information is used once the module is inserted. You must select a module type for the slot before you can pre-configure the parameters. If you pre-configure a slot for a specific module type, and then insert a different type of module, the module reverts to its default configuration.

For information on configuring I/O modules, see the ExtremeWare Software User Guide.

G4X, G6X, AND G8Xi MODULES

The G4X, G6X, and G8Xi modules are shown in Figure 1-4.

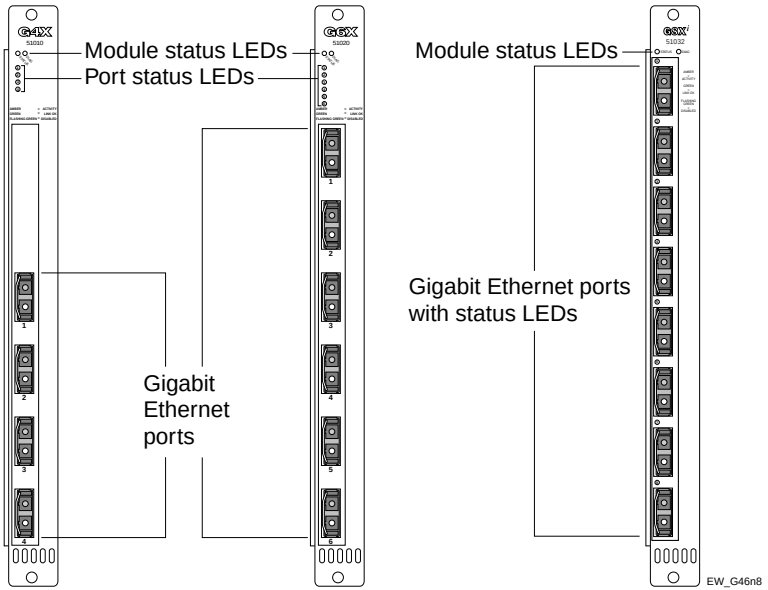

Figure 1-4: G4X module, G6X module, and G8Xi module

The G4X module has four GBIC-based Gigabit Ethernet ports. The G6X module has six GBIC-based Gigabit Ethernet ports. The G8Xi module has eight GBIC-based Gigabit Ethernet ports.

All Gigabit Ethernet ports on these modules use standard GBIC connectors and support 1000BASE-SX, 1000BASE-LX, and 1000BASE-LX70. The default configuration of the G4X, G6X, and G8Xi modules is as follows:

- All ports are added to the *default* VLAN as untagged.
- All ports inherit the properties of the *default* VLAN (for example, protocol type, VLANid, and so on).
- All ports are in auto-negotiation mode.

For supported media types and distances, refer to Table 1-1.

GBICs for the G8Xi module are sold separately.

G8SXI AND G12SXI MODULES

The G8SXi and G12SXi modules are shown in Figure 1-5.

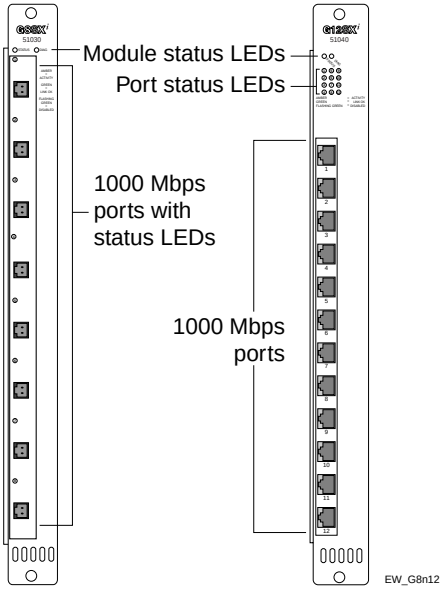

Figure 1-5: G8SXi module and G12SXi module

The G8SXi module has eight standard MT-RJ connectors. The G12SXi module has twelve standard MT-RJ connectors. Both modules support 1000BASE-SX. The default configuration of the G8SXi and G12SXi modules is as follows:

- All ports are added to the *default* VLAN as untagged.
- All ports inherit the properties of the *default* VLAN (for example, protocol type, VLANid, and so on).
- All ports are in auto-negotiation mode.

For supported media types and distances, refer to Table 1-1.

F32T AND F48TI MODULES

The F32T and F48Ti modules are shown in Figure 1-6.

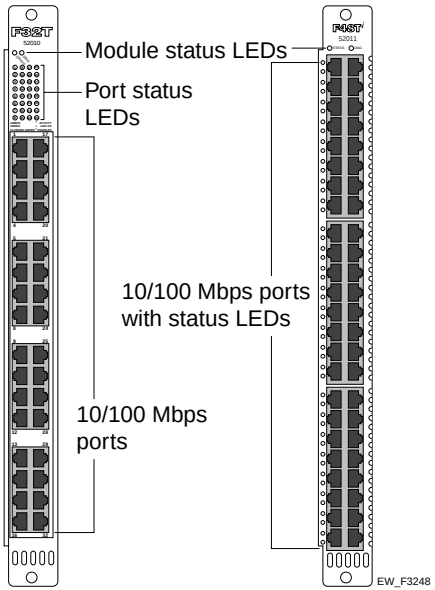

Figure 1-6: F32T and F48Ti modules

The F32T has 32 autosensing 10BASE-T/100BASE-TX ports. The F48Ti has 48 autosensing 10BASE-T/100BASE-TX ports. All ports use standard RJ-45 connectors. The default configuration of the F32T and F48Ti modules is as follows:

- All ports are added to the *default* VLAN as untagged.
- All ports inherit the properties of the *default* VLAN (protocol type, VLANid, and so on).
- All ports are in auto-negotiation mode allowing 10 Mbps, 100 Mbps, full-duplex, or half-duplex operation.

F32F MODULE

The F32F module, shown in Figure 1-7, has 32 100BASE-FX ports.

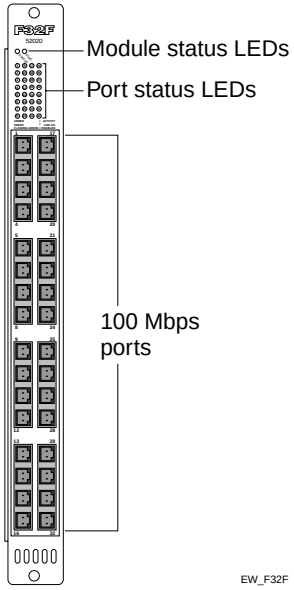

Figure 1-7: F32F module

All F32F ports use standard MT-RJ connectors. The default configuration of the F32F module is as follows:

- All ports are added to the *default* VLAN as untagged.
- All ports inherit the properties of the *default* VLAN (protocol type, VLANid, and so on).
- All ports are in 100 Mbps, full-duplex mode. Half-duplex mode is not supported.

I/O MODULE LEDS

Table 1-6 describes the LED behavior on the I/O modules.

Table 1-6: I/O Module LEDs

LED	Color	Indicates
Status	Green blinking	Normal operation
	Amber blinking	Configuration error, diagnostic failure, or other severe card error
	Off	No power
DIAG	Green	Normal operation
	Amber blinking	Diagnostics in progress
	Amber	Diagnostic failure
Port *x*	Green	Link up
	Amber	Packet activity
	Off	Link down

BLACKDIAMOND 6800 SWITCH REAR VIEW

Figure 1-8 shows the rear view of the BlackDiamond 6800 switch.

The rear view of the BlackDiamond 6800 switch provides the following:

- Access to the fan tray
- The chassis serial number
- The device Ethernet MAC address
- Safety information

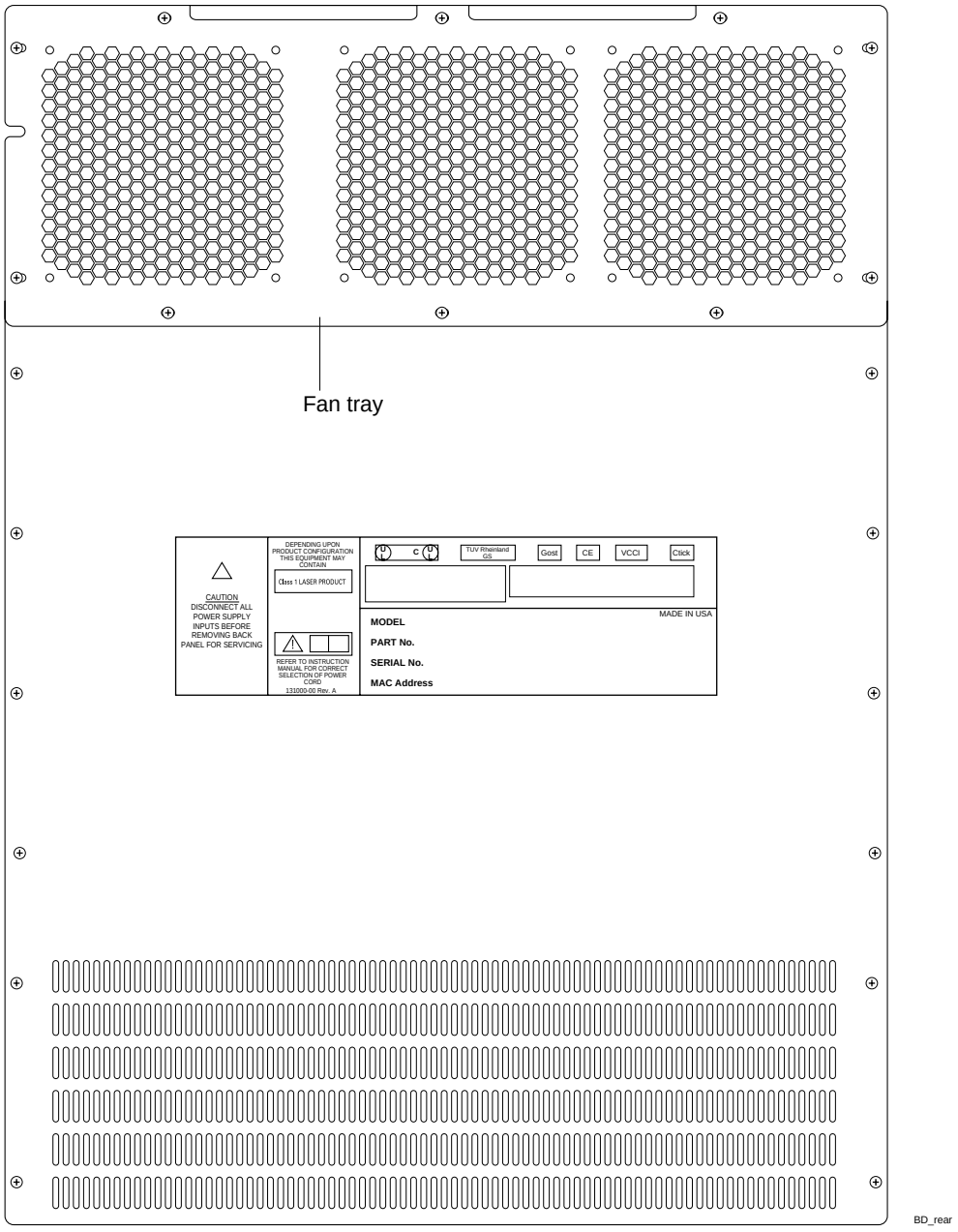

Figure 1-8: BlackDiamond 6800 switch rear view

BLACKDIAMOND 6800 SWITCH FAN TRAY

The fan tray contains three individual fans, and is accessed from the rear of the chassis. The fan status is monitored by the software for overheating conditions. All fan failures and over-temperature events trigger management alerts (for example SNMP traps and SYSLOG messages). For more information on switch monitoring, refer to the *ExtremeWare Software User Guide*.

Caution: Do not cover or obstruct the fan ventilation holes at the rear of the unit. Doing so can result in an overheat condition and possible damage to the BlackDiamond 6800 switch. Thermal sensors will shut down the BlackDiamond 6800 switch if the internal temperature exceeds 60 degrees Celsius.

GBIC TYPES AND HARDWARE/SOFTWARE SUPPORT

The switch supports two types of GBICs: the Parallel ID GBIC and the Serial ID GBIC. The switch uses identifier bits to determine the media type for the GBIC that is installed. Initial ExtremeWare versions do not support Serial ID GBICs. If Serial ID GBICs are installed in a switch with an initial software releases, the switch will not bring up the link on GBIC ports.

2 Installation and Setup

This chapter describes the following:

- How to decide where to install the BlackDiamond 6800 switch
- How to install the chassis in a rack
- How to install the power supply
- How to install modules in the chassis
- How to connect equipment to the console port
- How to check the installation using the Power On Self-Test (POST)

Caution: Use of controls or adjustments of performance or procedures other than those specified herein may result in hazardous radiation exposure.

Following Safety Information

All service to BlackDiamond 6800 modules, fan tray, and power supplies should be performed by trained service personnel, only.

Caution: Before installing or removing any components of the switch, or before carrying out any maintenance procedures, you must read the safety information provided in Appendix A of this guide.

DETERMINING THE SYSTEM LOCATION

The BlackDiamond 6800 switch is suited for use in a wiring closet or equipment room, where it can be mounted in a standard 19-inch equipment rack. Mounting brackets are integrated with the chassis.

When deciding where to install the BlackDiamond 6800 switch, ensure that

- The switch is accessible and cables can be connected easily.
- Water or moisture cannot enter the chassis.
- Air-flow around the unit and through the vents at the front, side, and rear of the chassis is not restricted. A minimum of 3 inches is required (5 inches recommended) for clearance.
- Temperature operating limits of 0° to 40° C are not exceeded.

INSTALLING THE BLACKDIAMOND 6800 SWITCH

The BlackDiamond 6800 switch can be mounted in a rack. The chassis is 15U high and fits in most standard 19-inch racks.

The BlackDiamond 6800 chassis is shipped empty; you must install the power supply and modules after rack-mounting the empty chassis.

Warning: Rack-mount the chassis before installing any BlackDiamond 6800 switch components.

To install the BlackDiamond 6800 switch, follow these steps:

1 Mount the helper bracket in the rack using four appropriate rack-mounting screws, as shown in Figure 2-1.

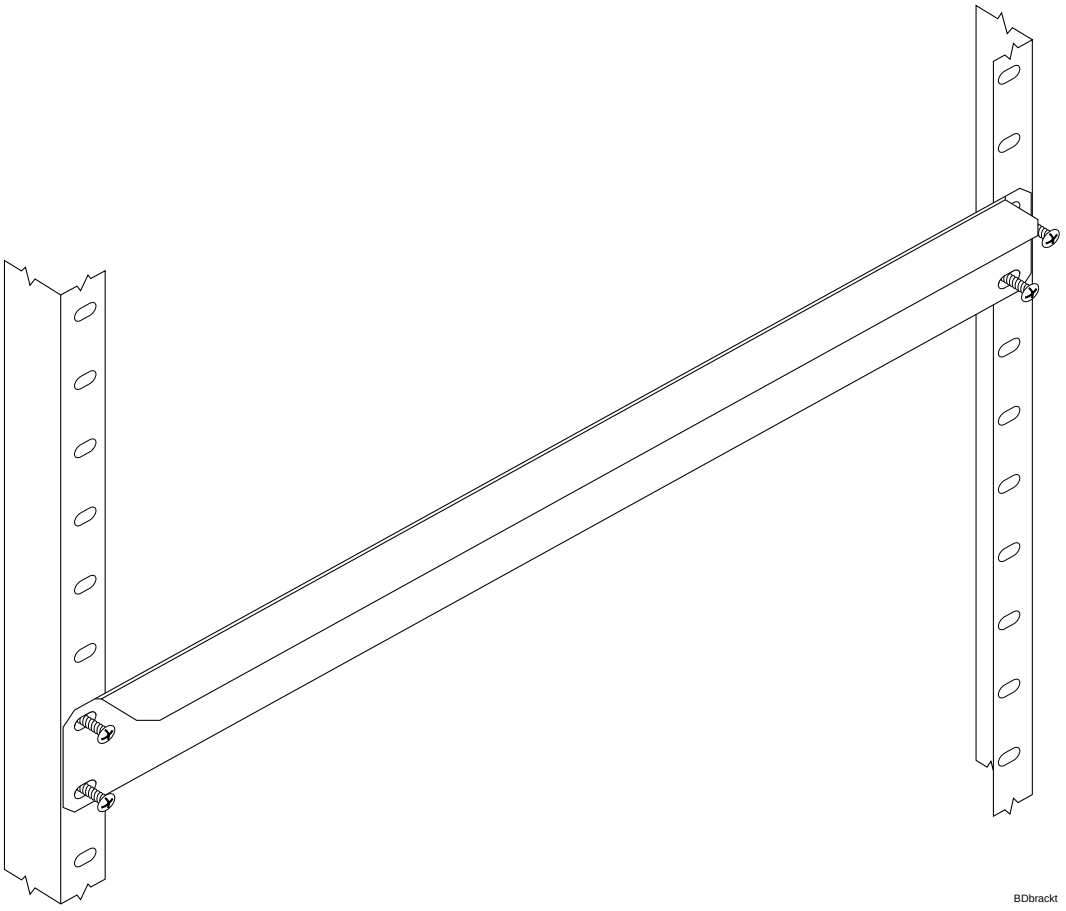

Figure 2-1: Rack-mount helper bracket

2 Insert the empty chassis into the 19-inch rack and place it on the helper bracket.

3 Secure the empty chassis with eight suitable screws, as shown in Figure 2-2.

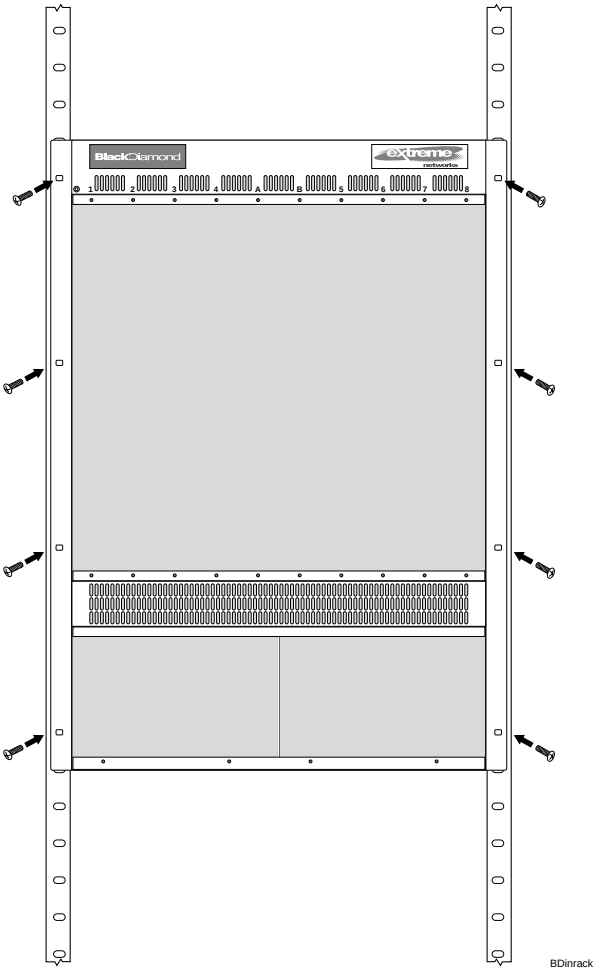

Figure 2-2: BlackDiamond 6800 chassis mounted in rack

4 Once the chassis is secured, remove the helper bracket.

5 Install the first power supply in an empty power supply bay by following these steps:

a Ensure that the power supply is right side up, and the locking handle is open.

Caution: Do not handle the power supply using the DC output bus bars. Support the power supply from the bottom, while holding the handle on the front of the power supply unit.

b Slide the power supply into the bay.

Caution: Be careful not to slam the power supply into the backplane. Only use the locking handle for inserting the power supply unit into the chassis.

c Secure the power supply by rotating the locking handle up until it clicks in place, and then tighten the screws using a #1 Phillips-head screwdriver.

6 To install a second power supply, remove the blank plate from the power supply bay on the right of the chassis using a #1 Phillips-head screwdriver.

7 Install the second power supply, as shown in Figure 2-3, by repeating the procedure described in Step 5.

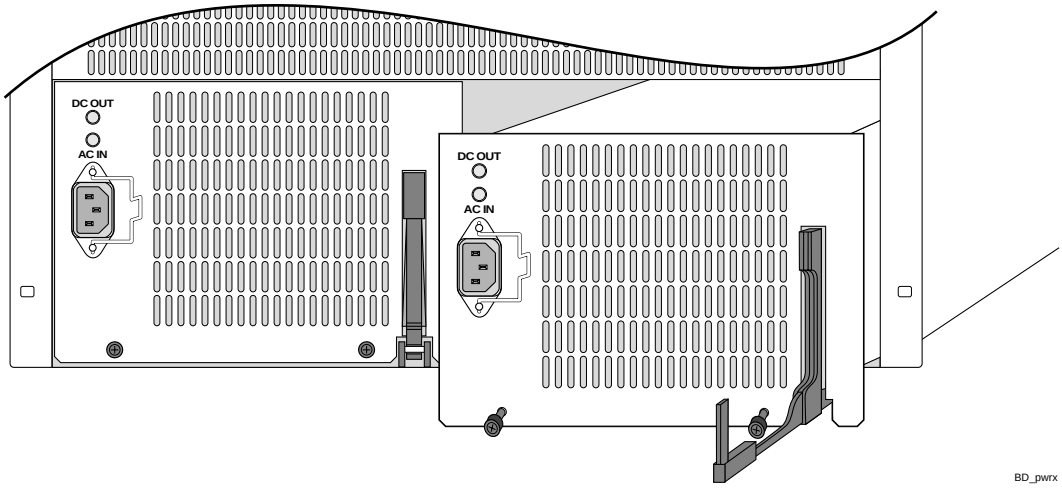

Figure 2-3: Power supply bays

8 Prior to installing module cards into the BlackDiamond 6800 chassis, put on the ESD wrist strap that is provided with the chassis, and connect the metal end to the ground receptacle located on the top-left corner of the BlackDiamond 6800 switch front panel.

Leave the ESD strap permanently connected to the BlackDiamond 6800 chassis, so that it is always available when you need to handle ESD-sensitive components.

9 To install the MSM64i follow these steps:

a Ensure that the MSM64i is right side up (printed circuit board, or PCB, to the right) and the ejector/injector handles are extended, as shown in Figure 2-4.

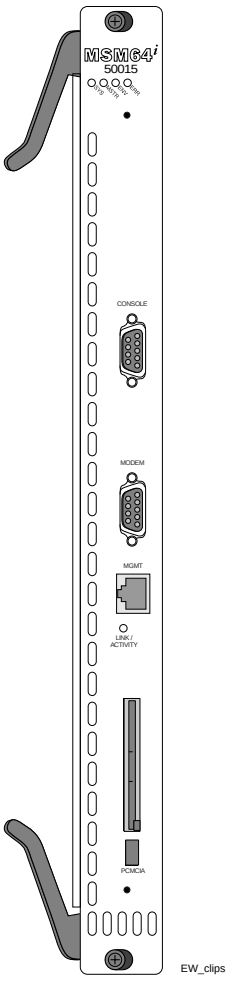

Figure 2-4: MSM64i with extended ejector/injector handles

b Slide the MSM64i into the appropriate slot of the chassis (Slot A or Slot B), until it is fully seated in the backplane.

Use the metal back panel, not the PCB, to guide the MSM64i into the chassis.

When the MSM64i is fully seated in the chassis, the ejector / injector handles will begin to close.

c To secure the MSM64i in the chassis, close the ejector/injector handles by pushing on them toward the center of the module card, and tighten the screws using a #1 Phillips-head screwdriver.

d Repeat this procedure for the second MSM64i, if applicable.

Caution: The MSM64i can be installed in Slot A or Slot B only. The MSM64i does not fit in any other chassis slots.

10 Install the I/O module(s) by following these steps:

a Ensure that the I/O module is right side up, and the ejector/injector handles are extended.

b Slide the I/O module into the appropriate slot of the chassis (Slots 1 through 8), until it is fully seated in the backplane.

When the I/O module is fully seated in the chassis, the ejector/injector handles will begin to close.

c To secure the module in the chassis, close the ejector/injector handles by pushing on them toward the center of the module card, and tighten the screws using a #1 Phillips-head screwdriver.

d Repeat this procedure for the additional I/O modules, if applicable.

Caution: The I/O module can be installed in any of the slots labeled Slot 1 through Slot 8 only. The I/O module does not fit in Slot A or Slot B. Forceful insertion may damage the I/O module.

POWERING ON THE SYSTEM

To turn on power to the system, connect the AC power cable to the power supply and then to the wall outlet. If you have installed two power supplies, connect both power cables. Figure 2-5 shows the BlackDiamond 6800 power cable and plug.

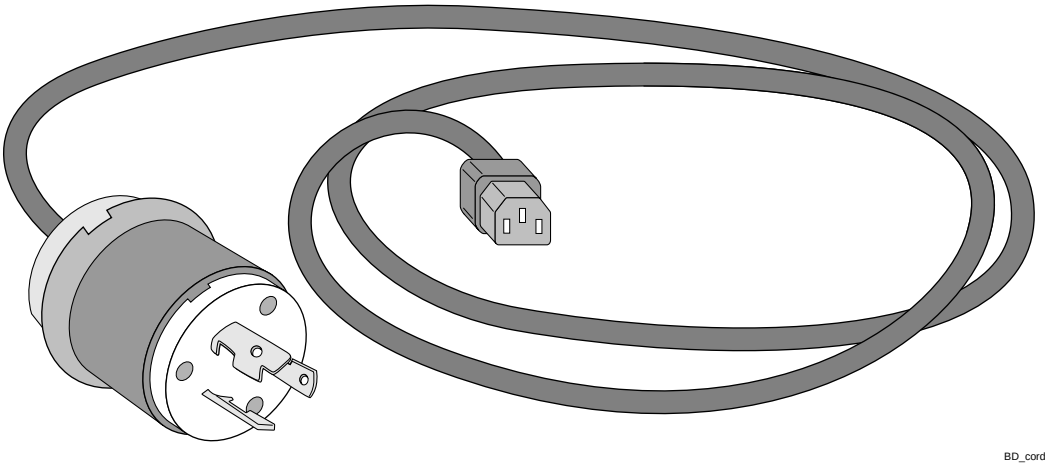

Figure 2-5: BlackDiamond Power Cable and Plug

CHECKING THE INSTALLATION

After turning on power to the BlackDiamond 6800 switch, each MSM64i performs a power-on self test (POST) of its circuitry. The LED labeled “SYS” on the MSM64i blinks amber during the POST. Once the MSM64i is operational, each I/O module performs a POST.

For more information on the LEDs, refer to Chapter 1.

CONNECTING EQUIPMENT TO THE CONSOLE PORT

Connection to the console port is used for direct local management. The console port settings are configured as follows:

- **Baud rate** — 9600
- **Data bits** — 8
- **Stop bit** — 1
- **Parity** — None
- **Flow control** — XON/XOFF

The terminal connected to the console port on the MSM64i must be configured with the same settings. This procedure will be described in the documentation supplied with the terminal.

Appropriate cables are available from your local supplier. To make your own cables, pinouts for a DB-9 male console connector are described in Table 2-1.

Table 2-1: Console Connector Pinouts

Function	Pin Number	Direction
DCD (data carrier detect)	1	In
RXD (receive data)	2	In
TXD (transmit data)	3	Out
DTR (data terminal ready)	4	Out
GND (ground)	5	-
DSR (data set ready)	6	In
RTS (request to send)	7	Out
CTS (clear to send	8	In

Figure 2-6 shows the pinouts for a 9-pin to 25-pin (RS-232) null-modem cable.

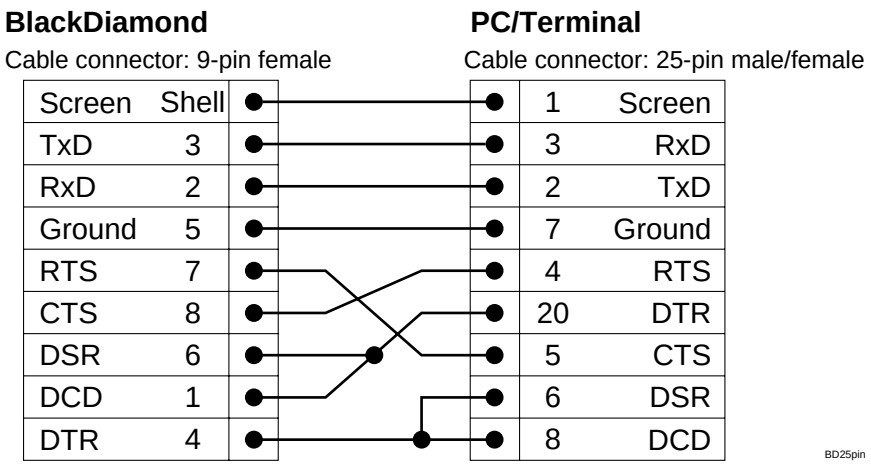

Figure 2-6: Null-modem cable pinouts

Figure 2-7 shows the pinouts for a 9-pin to 9-pin (PC-AT) null-modem serial cable.

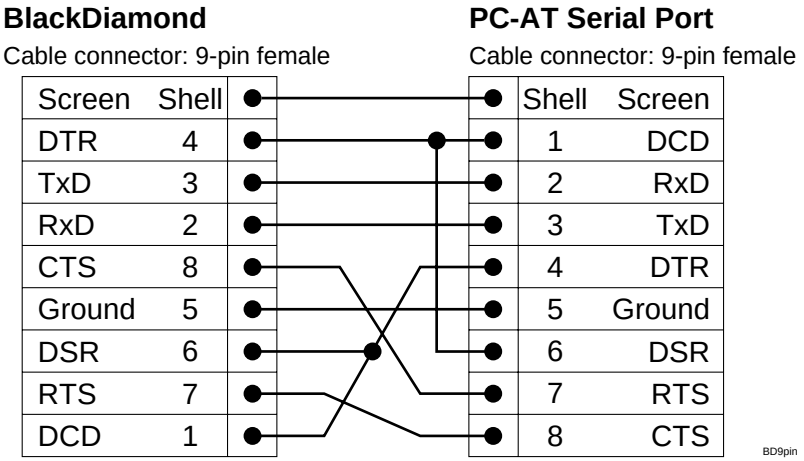

Figure 2-7: PC-AT serial null-modem cable pinouts

LOGGING IN FOR THE FIRST TIME

After the BlackDiamond 6800 switch has completed the POST, it is operational. Once operational, you can log in to the switch and configure an IP address for the default VLAN (named *default*).

To manually configure the IP settings, perform the following steps:

1. Connect a terminal or workstation running terminal-emulation software to the MSM64i console port.
2. At your terminal, press [Return] one or more times until you see the login prompt.
3. At the login prompt, enter the default user name *admin* to log on with administrator privileges. For example:

   ```
   login: admin
   ```

   Administrator capabilities allow you to access all switch functions.

For more information on switch security, refer to the ExtremeWare Software User Guide.

4 At the password prompt, press [Return].

The default name, *admin,* has no password assigned. When you have successfully logged on to the system, the command-line prompt displays the system name (for example, `BlackDiamond6800>` in its prompt.

5 Assign an IP address and subnetwork mask for VLAN *default* by typing

```
config vlan default ipaddress 123.45.67.8 255.255.255.0
```

Your changes take effect immediately.

6 Save your configuration changes so that they will be in effect after the next system reboot, by typing

```
save
```

The configuration is saved to the configuration database of both MSM64i modules.

For more information on saving configuration changes, refer to the ExtremeWare Software User Guide*.*

7 When you are finished using the facility, log out by typing

```
logout
```

3 Service and Maintenance

This chapter describes the following:

- How to remove and replace a module card
- How to remove and replace a power supply
- How to remove and replace the fan tray
- How to add and remove SODIMMs on the MSM64i
- How to add and remove a GBIC

Caution: Use of controls or adjustments of performance or procedures other than those specified herein may result in hazardous radiation exposure.

Following Safety Information

All service to BlackDiamond 6800 modules, fan tray, and power supplies should be performed by trained service personnel, only.

Caution: Before installing or removing any components of the system, or before carrying out any maintenance procedures, you must read the safety information provided in Appendix A of this guide.

REMOVING AND REPLACING A MODULE CARD

All BlackDiamond 6800 module cards (MSM64i modules and I/O modules) are hot-swappable. You do not need to power off the system to remove or insert a module card.

To remove and replace a module card, follow these steps:

1. Prior to installing module cards into the BlackDiamond 6800 chassis, put on the ESD wrist strap that is provided with the chassis, and connect the metal end to the ground receptacle located on the top-left corner of the BlackDiamond 6800 front panel.
2. Loosen the module card by unscrewing the screws using a #1 Phillips-head screwdriver.
3. Rotate the ejector/injector handles to disengage the module card from the backplane.
4. Slide the module card out of the chassis.
5. Slide the new module card into the appropriate slot of the chassis (Slots 1 through 8), until it is fully seated in the backplane.
6. When the module is fully seated in the chassis, the ejector/injector handles will begin to close.
7. To secure the module in the chassis, close the ejector/injector handles by pushing on them toward the center of the module card, and tighten the screws using a #1 Phillips-head screwdriver.

Caution: The I/O module can be installed in any of the slots labeled Slot 1 through Slot 8 only. The I/O module does not fit in Slot A or Slot B. The MSM64i modules can be installed in Slot A and Slot B. Forceful insertion may damage the module.

REMOVING AND REPLACING A POWER SUPPLY

BlackDiamond 6800 power supplies are hot-swappable. You can add a second power supply without powering off the chassis. If you have two power supplies installed, you can remove one of them without powering off the chassis.

To remove and replace a power supply, follow these steps:

1. Remove the power supply cord from the power supply and retention clip.
2. Unscrew the power supply using a #1 Phillips-head screwdriver.
3. Disengage the power supply by rotating the handle out and down.

   The power supplies are shown in Figure 3-1.

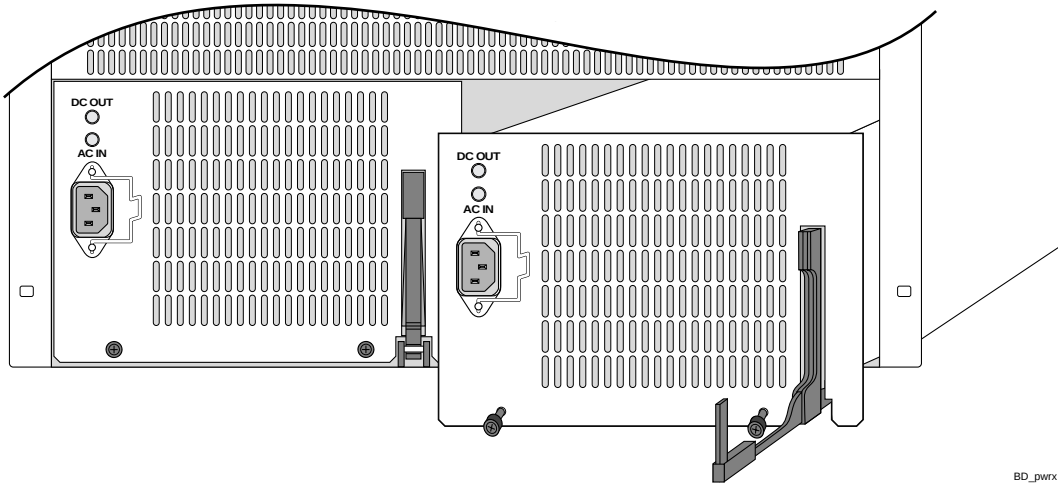

Figure 3-1: BlackDiamond 6800 power supplies

4. Slide the power supply out of the chassis.

Caution: Do not handle the power supply using the DC output bus bars.

5. Ensure that the replacement power supply is right-side up, and the locking handle is open.
6. Slide the power supply into the bay.

Caution: Do not slam the power supply into the backplane.

7 Secure the power supply by pushing down on the locking handle until it clicks in place, and then tighten the screws using a #1 Phillips-head screwdriver.

REMOVING AND REPLACING THE FAN TRAY

The BlackDiamond 6800 fan tray is hot-swappable. You do not need to turn off power to the BlackDiamond 6800 switch to replace the fan tray. Access to the fan tray is from the rear of the BlackDiamond 6800 chassis.

To remove and replace the fan tray, follow these steps:

1 Unscrew the ten screws securing the fan tray to the chassis, as shown in Figure 3-2.

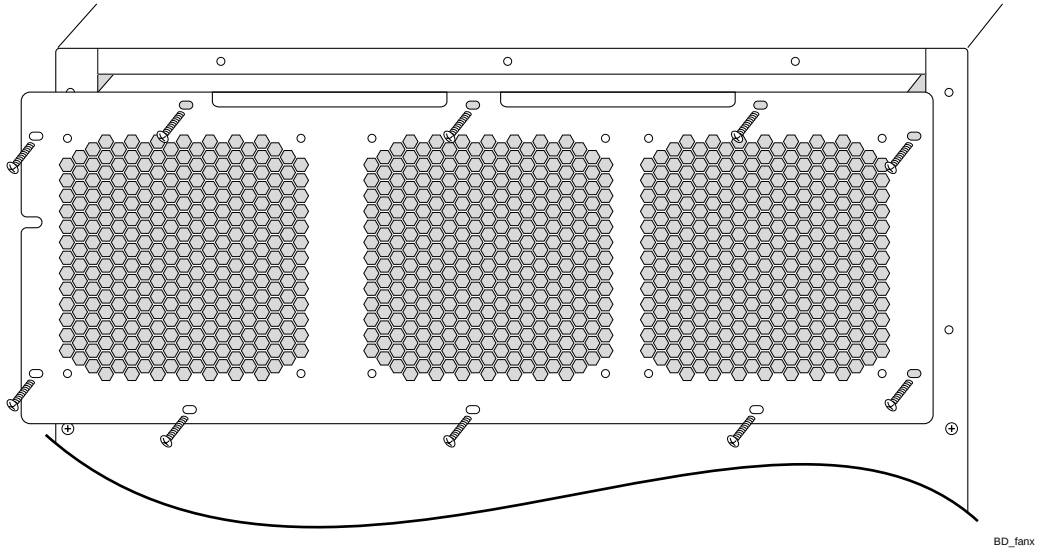

Figure 3-2: Removing the fan tray

2 Pull the fan tray straight back out of the chassis approximately ½ inch; this step disconnects the power, causing the fans to stop.

3 Allow the fan blades to stop spinning before removing the fan tray completely.

Warning: Avoid personal injury. Keep hands away from rotating fan blades.

4 Insert the new fan tray into the bay.

5 Tighten the fan tray using the screws you removed in Step 1.

ADDING AND REMOVING SODIMMS

To add a SODIMM to the MSM64i, follow these steps:

1 Prior to removing or installing SODIMMs on the MSM64i, put on the ESD wrist strap that is provided with the chassis, and connect the metal end to the ground receptacle located on the top-left corner of the BlackDiamond 6800 switch front panel.

2 Locate the SODIMM sockets on the MSM64i.

3 Position the SODIMM in the socket by ensuring that the gold fingers of the SODIMM slip into the connector and the keying notches align.

4 Secure the SODIMM by pressing down firmly until the SODIMM is locked into the socket and the ejector locks rotate into position, as shown in Figure 3-3.

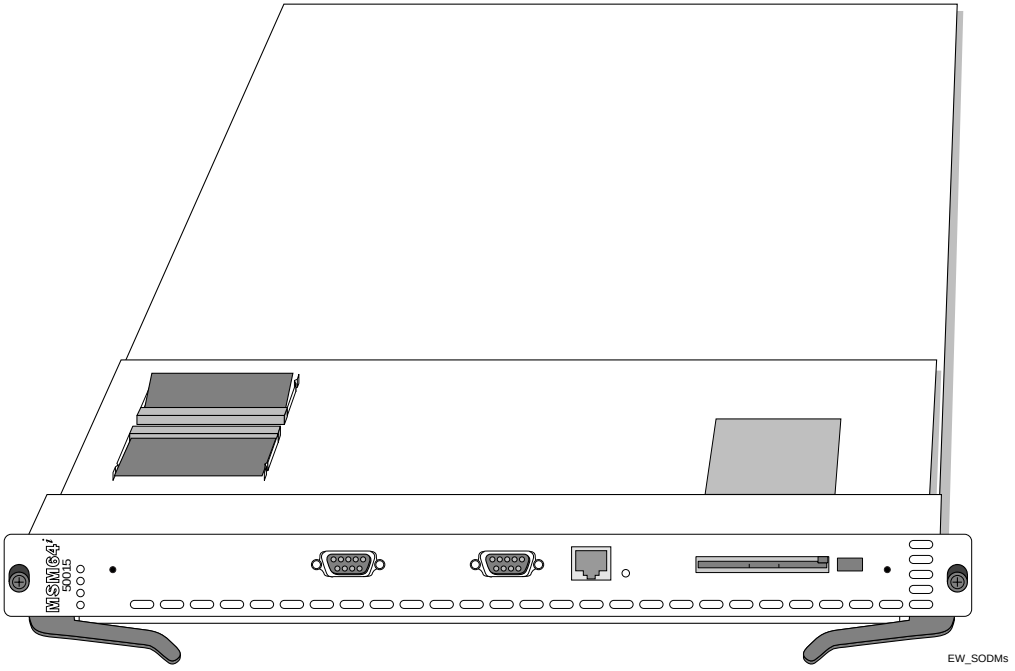

Figure 3-3: Adding a SODIMM

To remove a SODIMM, follow these steps:

1. Prior to removing or installing SODIMMs on the MSM64i, put on the ESD wrist strap that is provided with the chassis, and connect the metal end to the ground receptacle located on the top-left corner of the BlackDiamond 6800 switch front panel.
2. Disengage the SODIMM by pulling out on the ejector locks located on either side of the SODIMM.
3. Rotate the SODIMM out of the socket.

ADDING AND REMOVING GBICS

GBICs can be added and removed from the BlackDiamond 6800 switch without powering off the system. The two types of GBIC connectors are shown in Figure 3-4.

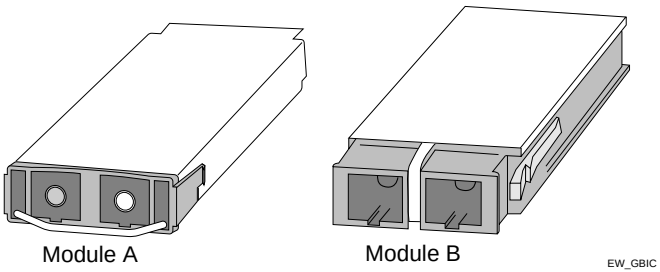

Figure 3-4: GBIC connectors

GBICs are a Class 1 laser device. Use only Extreme-approved devices.

To remove the GBIC connector labeled "Module A," lift up on the front handle and pull the GBIC out of the slot.

To remove the GBIC connector labeled "Module B," gently squeeze the sides to release it, and pull the GBIC out of the slot.

Ensure that the SC fiber-optic connector is removed from the GBIC prior to removing the GBIC from the I/O module.

Caution: Invisible laser radiation can occur when open. Avoid direct eye exposure to beam.

To insert a GBIC connector, follow these steps:

1. Holding the GBIC by its sides, insert the GBIC into the slot on the I/O module.
2. Slide the GBIC as far back into the slot as possible, until you hear it click.
3. If the GBIC has a handle, push down on the handle to secure the GBIC in the slot.

A Safety Information

IMPORTANT SAFETY INFORMATION

WARNING: READ THE FOLLOWING SAFETY INFORMATION THOROUGHLY BEFORE INSTALLING THE BLACKDIAMOND 6800 SWITCH. FAILURE TO FOLLOW THIS SAFETY INFORMATION MAY LEAD TO PERSONAL INJURY OR DAMAGE TO THE EQUIPMENT.

- Installation, maintenance, removal of parts, and removal of the unit and components must be done by qualified service personnel only.

  Service personnel are persons having appropriate technical training and experience necessary to be aware of the hazards to which they are exposed in performing a task and of measures to minimize the danger to themselves or other persons.
- Install the unit only in a temperature- and humidity-controlled indoor area free or airborne materials that may conduct electricity. Too much humidity may cause a fire. Too much dryness may produce electrical shock and fire.

POWER

This unit has two power inputs.

- Disconnect power before removing the back panel of the unit.
- The unit must be grounded.

- The unit must be connected to a grounded outlet to comply with European safety standards.
- Do not connect the power supply unit to an A/C outlet without a ground connection.
- The socket outlet must be near to the unit and easily accessible. You can only remove power from the unit by disconnecting the power cord from the outlet.
- This unit operates under Safety Extra Low Voltage (SELV) conditions according to IEC 950. The conditions are only maintained if the equipment to which it is connected also operates under SELV conditions.
- The appliance coupler (the connector to the unit and not the wall plug) must have a configuration for mating with an EN60320/IEC320 appliance inlet.
- *France and Peru only*
  This unit cannot be powered from IT† supplies. If your supplies are of IT type, this unit must be powered by 230V (2P+T) via an isolation transformer ratio 1:1, with the secondary connection point labeled Neutral, connected directly to ground.

POWER CORD

- This must be approved for the country where it is used:

USA and Canada	• The cord set must be UL-approved and CSA-certified. • The minimum specification for the flexible cord is No. 16 AWG (1.5 mm^2), Type SV or SJ, 3-conductor. • The cord set must have a rated current capacity of at least 10A. • The attachment plug must be an Earth-grounding type with a NEMA L6-20P (20A, 250V) configuration.
Denmark	• The supply plug must comply with section 107-2-D1, standard DK2-1a or DK2-5a.
Switzerland	• The supply plug must comply with SEV/ASE 1011.

- If the power cord plug is unsuitable and must be replaced, you may find other codings for the respective connections. Connect the power supply wires for the unit according to the following scheme:
  — Brown wire to the Live (Line) plug terminal, which may be marked with the letter “L” or colored red.

— Blue wire to the Neutral plug terminal, which may be marked with the letter "N" or colored black.

— Yellow/Green wire to the Ground plug terminal, which may be marked with the letter "E" or the Earth symbol or colored yellow/green.

CONNECTIONS

- **Fiber Optic ports - Optical Safety.** Never look at the transmit LED/laser through a magnifying device while it is powered on. Never look directly at the fiber TX port and fiber cable ends when they are powered on.
- CLASS 1 LASER DEVICE

LITHIUM BATTERY

- The battery in the bq4830/DS1644 device is encapsulated and not user-replaceable. The battery is located on the MSM motherboard.
- If service personnel disregard the instructions and attempt to replace the bq4830/DS1644, replace the lithium battery with the same or equivalent type, as recommended by the manufacturer.

Warning: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- Disposal requirements vary by country and by state.
- Lithium batteries are not listed by the Environmental Protection Agency (EPA) as a hazardous waste. Therefore, they can typically be disposed of as normal waste.
- If you are disposing of large quantities, contact a local waste-management service.
- No hazardous compounds are used within the battery module.
- The weight of the lithium contained in each coin cell is approximately 0.035 grams.
- Two types of batteries are used interchangeably:
  — CR chemistry uses manganese dioxide as the cathode material.
  — BR chemistry uses poly-carbonmonofluoride as the cathode material.

B Technical Specifications

Physical Dimensions	Height 26.25 inches x Width: 17.32 inches x Depth: 18 inches
Weight — Empty chassis	60 pounds
Weight — Fully loaded chassis	170 pounds
Weight — Each power supply	30 pounds
Weight — Each module card	5 pounds
Environmental Requirements	
Operating Temperature	0° to 40° C
Storage Temperature	-10° to 70° C
Operating Humidity	10% to 95% relative humidity, noncondensing
Standards	EN60068 to Extreme IEC68 schedule
Certification Marks	
CE	CE (European Community)
TUV/GS	TUV/GS (German Notified Body)
GOST	GOST (Russian Federation)
C-Tick	C-Tick (Australian Communication Authority)
c UL us LISTED	Underwriters Laboratories (USA and Canada)

Safety	
Agency Certifications	UL 1950 3rd Edition, listed EN60950:1992/A1-4:1997 plus ZB/ZC Deviations IEC 950CB Low Voltage Directive (LVD) CSA 22.2#950-95 AS/NZS 3260 EN60825-1 FCC CFR 21
Electromagnetic Interference/ Compatibility (EMI/EMC)	FCC CFR 47 part 15 Class A ICES-0003 A/C108.8-M1983 Class A VCCI Class A AS/NZS 3548 EN55022 Class A CISPR 22 Class A EN50082 -1:1997 include ENV 50204 EN55024:1998 includes IEC 61000-4-2, 3, 4, 5, 6, 8, 11 EN 61000-3-2, 3 CNS 13438 Class A
Heat Dissipation	1225W maximum (4185 BTU/hr maximum)
Power Supply	
AC Line Frequency	47Hz to 63Hz
Input Voltage Options	180 VAC to 264 VAC, auto-ranging
Current Rating	200-240 VAC 10 A

Index

A

air-flow requirements 2-2

B

BlackDiamond
- air-flow requirements 2-2
- certification marks B-1
- components 1-5
- console port 1-8
- dimensions B-1
- features 1-1
- I/O modules 1-11
- installing 2-2
- MAC address 1-17
- media distances, supported 1-4
- media types, supported 1-4
- MSM64i, description 1-7
- port connections 1-3
- power supply 1-7
- powering on 2-7
- rear view 1-17
- serial number 1-17
- size B-1

C

cable types and distances 1-4
certification marks B-1
chassis rear view 1-17
components 1-5
configuring IP settings 2-10
console port 1-8
- connecting equipment to 2-8
- settings 2-8

conventions
- notice icons x
- text x

D

DIMMs
- description 1-9
- installing and removing 3-5

F

F32F module 1-3, 1-16
F32T module 1-3, 1-15
F48Ti module 1-3, 1-15
fan tray
- installing 3-4
- removing 3-4

features 1-1
full-duplex 1-5

G

G12SXi module 1-3, 1-14
G4X module 1-3, 1-12
G6X module 1-3, 1-12
G8SXi module 1-3, 1-14
G8Xi module 1-3, 1-12
GBICs, installing and removing 3-7

H

helper bracket, installing 2-2

I

I/O modules
- description 1-11
- hot-swapping 1-12
- installing 2-7, 3-2
- LEDs 1-17
- removing 3-2

installation
- chassis 2-2
- DIMMs 3-5
- fan tray 3-4
- GBICs 3-7
- helper bracket 2-2
- I/O modules 2-7, 3-2
- MSM64i 2-5, 3-2
- power supply 2-4, 3-3
- rack-mounting 2-2

installing the system 2-2
IP settings, configuring 2-10

L

LEDs
- I/O modules 1-17
- MSM64i 1-11
- power supply 1-7

logging in 2-10

M

MAC address 1-17
Management Switch Fabric Module 64. *See* MSM64i
media types and distances 1-4
memory, MSM64i 1-9
MSM64i
- booting 1-9
- console port 1-8
- console port settings 2-8
- description 1-7
- installing 2-5, 3-2
- installing DIMMs 3-5
- LEDs 1-11
- master, slave functionality 1-8
- memory 1-9
- ports 1-8
- removing 3-2
- removing DIMMs 3-5
- saving configuration 1-9

P

ports
- connections 1-3
- console port settings 2-8
- installing and removing GBICs 3-7
- MSM64i 1-8

power supply
- installing 2-4, 3-3
- LEDs 1-7
- removing 3-3
- voltage 1-7

powering on 2-7
power-on self test (POST) 2-8

R

rack-mounting 2-2
related publications xi

S

safety information A-1
saving configuration 1-9
serial number 1-17

T

turning on 2-7

V

verifying the installation 2-8